ABSTRACT

Seoul virus (SEOV) is one of four known hantaviruses causing hemorrhagic fever with renal syndrome (HFRS). Candidate naked DNA vaccines for HFRS were constructed by subcloning cDNA representing the medium (M) (encoding the G1 and G2 glycoproteins) or small (S) (encoding the nucleocapsid protein) genome segment of SEOV into the DNA expression vector pWRG7077. We vaccinated BALB/c mice with three doses of the M or S DNA vaccine at 4-week intervals by either gene gun inoculation of the epidermis, or needle inoculation into the gastrocnemius muscle. Both routes of vaccination resulted in antibody responses as measured by ELISA; however, gene gun inoculation elicited a higher frequency of seroconversion, and higher levels of antibodies in individual mice. We vaccinated Syrian hamsters with the M or S construct using the gene gun and found hantavirus-specific antibodies in 5/5 and 4/5 hamsters, respectively. Animals vaccinated with the M construct developed a neutralizing antibody response which was greatly enhanced in the presence of guinea pig complement. Immunized hamsters were challenged with SEOV and, after 28 days, were monitored for evidence of infection. Hamsters vaccinated with M were protected from infection, but hamsters vaccinated with S were not protected.